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Louis C. Haddad

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3M INNOVATIVE PROPERTIES COMPANY  
PO BOX 33427  
ST. PAUL, MN 55133-3427

EXAMINER

VENCI, DAVID J

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### DETAILED ACTION

The indicated allowability of claim 5 (see prior Office Action, page 10) is withdrawn in view of recently discovered teachings of Fleming *et al.* (US 6,503,564). New grounds of rejection based on the teachings of Fleming *et al.* are set forth *infra*, section *Claim Rejections - 35 USC § 103*.

Claim 6 remains objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

With respect to withdrawn claim 16, Examiner withdraws the restriction requirement of January 19, 2007 (see *infra*, section *Restriction/Rejoinder*).

Claims 14 and 17-31 remain withdrawn from consideration as being directed to non-elected inventions (see Office Action dated April 9, 2007).

Currently, claims 1-4, 6-8, 10, 11, 13, 15, 16, 32 and 33 are under examination.

This application was filed under 35 U.S.C. § 111(a) on March 26, 2004, and claims priority under 35 U.S.C. § 119(e) to provisional application 60/532,404, filed December 24, 2003.

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***Restriction/Rejoinder***

Herein, Examiner withdraws the restriction requirement of January 19, 2007, with respect to species claim of Invention III (claim 16).

New restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-4, 6-8, 10, 11, 13, 15, 16, 32 and 33 drawn to methods comprising, *inter alia*, providing a surface comprising covalently or hydrophobically attached sites, classified in class 427/282, for example.
- II. Claim 14, drawn to a method comprising, *inter alia*, providing a material comprising particles, classified in class, 264/127 for example.
- III. Claim 17, drawn to a method comprising, *inter alia*, providing a protein, classified in class 435/183, for example.
- IV. Claims 18-21, drawn to a product subcombination comprising, *inter alia*, material, classified in class 106/637, for example.
- V. Claims 22-25, drawn to a product combination comprising, *inter alia*, material comprising particles, classified in class 427/2.14, for example.
- VI. Claims 26-28, drawn to a product combination comprising, *inter alia*, material comprising a membrane, classified in class 442/289, for example.
- VII. Claims 29-31, drawn to a product combination comprising, *inter alia*, material comprising emulsion, classified in class 516/31, for example.

The inventions are distinct, each from the other because of the following reasons:

Inventions I, II and III are unrelated<sup>1</sup> processes because each has a different mode of operation. For example, Invention I requires a step of providing a surface comprising covalently or hydrophobically attached sites, while Invention II requires a step of providing a material comprising particles, while Invention III requires a step of providing a protein.

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Inventions (V, VI or VII) and IV are related as combinations and subcombination, respectively.<sup>2</sup> The combinations of Inventions V, VI and VII are distinct from the subcombination of Invention IV because the combinations do not require the particulars of Invention IV for patentability. For example, the “particles” of Invention V have separate patentable utility in pharmaceuticals. The “membranes” of Invention VI have separate patentable utility in optics systems. And, the “emulsions” of Invention VII have separate patentable utility in cleaning agents. Finally, the subcombination of Invention IV has separate patentable utility as an image-enhancing contrast agent, for example.

Inventions V, VI and VII are unrelated products because each has a different design. For example, Invention V requires “particles”, while Invention VI requires “membranes”, while Invention VII requires “emulsions”.

Inventions (IV, V, VI or VII) and (I, II or III) are related<sup>3</sup> as products and processes of use, respectively. The products of Inventions IV, V, VI and VII are distinct from the processes of Inventions I, II and III because the products can be used in a materially different processes. For example, the products can be used in cleaning agents, for example.

Examination on the merits is restricted to originally presented and elected invention corresponding to Invention I, *supra*. Claims 14 and 17-31 remain withdrawn from consideration as being directed to non-elected inventions (see Office Action dated April 9, 2007). See 37 CFR 1.142(b) and MPEP § 821.03.

Currently, claims 1-4, 6-8, 10, 11, 13, 15, 16, 32 and 33 are under examination.

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<sup>1</sup> Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different designs, modes of operation, and effects (MPEP § 802.01 and § 806.06).

<sup>2</sup> Inventions in this relationship are distinct if it can be shown that (1) the claimed combinations do not require the particulars of the claimed subcombination for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)).

<sup>3</sup> The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product. See MPEP § 806.05(h).

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-4, 6-8, 10, 11, 13, 15, 16, 32 and 33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 1 and 16, formula (I), the terms “box”, “R<sub>f</sub>”, “R” and “R<sup>2</sup>” are indefinite in view of antecedent term “segments” in step 3. Whether/which, if any, of “box” AND/OR/XOR “R<sub>f</sub>” AND/OR/XOR “R” AND/OR/XOR “R<sup>2</sup>” is a segment of the step 3 “segments” is not clear.

In claim 15, formula (I), the terms “box”, “R<sub>f</sub>”, “R” and “R<sup>2</sup>” are indefinite in view of antecedent term “segments” in step 2. Whether/which, if any, of “box” AND/OR/XOR “R<sub>f</sub>” AND/OR/XOR “R” AND/OR/XOR “R<sup>2</sup>” is a segment of the step 2 “segments” is not clear.

Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. Specifically, claim 3 appears to further require the “capture sites” of claim 1 to be comprised in/to/into/at/from “sorptive particles”. Whether/how the “capture sites” are simultaneously “covalently attached or hydrophobically attached to the solid phase material” AND comprised in/to/into/at/from “sorptive particles” is not clear.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 4, 7, 8, 10, 11, 13, 15, 16, 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anderson *et al.* (US 6,653,151) in view of Fleming *et al.* (US 6,503,564).

Anderson *et al.* describe a method of reducing non-specific binding of target molecules to a surface, the method comprising:

1. providing a sample comprising target molecules (see *e.g.*, col. 19, lines 35-36, “blocking agent, such as albumin or milk”; lines 54-55, “vital dye such as trypan blue or fluorescein acetate”);
2. providing a solid phase material comprising:
  - a. a surface that comprises a hydrophobic portion (see *e.g.*, col. 8, lines 56-57, “Teflon coated materials”; see *also*, Fig. 2C, *noting* the exposed areas of solid surface 6; see *e.g.*, col. 11, lines 62-64, “fibers are comprised of hollow impermeable tubules typically formed from plastics including[...] Teflon®”; see *also*, Fig. 2B, *noting* the exposed areas of solid surface 6 and fiber tube 8); and
  - b. capture sites (see *e.g.*, col. 7, lines 23-24, “Libraries of cells, microorganisms, and subcellular structures”; lines 54-57, “plant and animal cells and organelles or fractions of each may each

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be a binding component”) covalently or hydrophobically attached to the solid phase material (see col. 8, lines 57-67, “binding molecules[...] are prebound to a solid phase surface”; see *also*, paragraph bridging columns 7-8, “The term ‘bind’ includes any physical attachment or close association”; see *also*, col. 14, lines 20-21, “Teflon® surfaces will tenaciously bind proteins or other macromolecules that have been suitably fluorinated”);

4. contacting the solid phase material with a fluorinated blocking agent to block at least a portion of the surface (see col. 26, lines 36-41, “Surface treatment with a material repellant to the fluid to be eventually located inside each cell”, “fluorinating (Teflonizing) or silanizing agents”), wherein non-specific binding of target molecules to the surface is decreased relative to a non-contacted solid phase material (see col. 26, lines 36-41, “fluorinating (Teflonizing) or silanizing agents repel water thereby generating sufficient surface tension to reduce cross leakage between cells of the microarray”);
5. contacting the solid phase material with the sample so that at least a portion of the target molecules of the sample adhere to the capture sites (see *e.g.*, col. 7, lines 24-28, “The array may be used[...] to screen a candidate compound against a number of biological materials”).

Anderson *et al.* do not incorporate a step of contacting or blocking “a portion” of the hydrophobic portion of the surface using a “nonionic surfactant comprising two or more fluorinated hydrophobic segments and one or more hydrophilic segments”.

However, Fleming *et al.* describe:

3. providing a surfactant (see col. 4, lines 4-9, “multiple profile-preserving coatings of the same or different materials can be deposited to further affect one or more surface properties, such as[...] release properties”) comprising:



- a. two or more groups (see col. 9, line 60, "monomer mixtures") including at least one linear perfluorinated segment of Formula I (see col. 13, lines 19-24, "2-(N-ethylperfluorooctanesulfonamido) ethyl acrylate, ethylperfluorooctanesulfonamido) ethyl (meth)acrylate, 2-(N-butylperfluorooctanesulfonamido) ethyl acrylate, butylperfluorooctylsulfonamido ethyl (meth)acrylate, ethylperfluorooctylsulfonamidoethyl (meth)acrylate") (emphasis added); and
  - b. one or more segments hydrophilic relative to linear perfluorinated segments (see col. 13, lines 19-24, "2-(N-ethylperfluorooctanesulfonamido) ethyl acrylate, ethylperfluorooctanesulfonamido) ethyl (meth)acrylate, 2-(N-butylperfluorooctanesulfonamido) ethyl acrylate, butylperfluorooctylsulfonamido ethyl (meth)acrylate, ethylperfluorooctylsulfonamidoethyl (meth)acrylate") (emphasis added);
4. contacting a solid phase material with the fluorinated nonionic surfactant to block at least a portion of the surface (see col. 6, lines 45-50, "the coating material 100 can be directed through a coating die 110 and onto a microstructured surface 111 of substrate 112. A mask[...] can optionally be placed [between] to coat selected portions of the substrate surface 111") (paraphrasing added).

It would have been obvious for persons of ordinary skill to perform Anderson's method of making non-stick surfaces using Fleming's vapor deposition and surfactant technique because Fleming *et al.* say their method is able to maintain surface "profile" features and masks (see col. 6, lines 47-50) with hard-to-reach places (see Fig. 3 and supporting text). In addition, Fleming's method is able to coat carbohydrates, amino acids and peptides (see Fleming *et al.*, col. 11, line 22), which Anderson *et al.* may use to coat capture molecules (see *e.g.*, Anderson *et al.*, agent-of-interest layer 9) in addition to non-stick layers. Thus, the teachings of Fleming *et al.* afford Anderson *et al.* the opportunity to accomplish one of their overall goals of increasing array density (see Anderson *et al.*, col. 2, lines 42-54).

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With respect to claims 4, 32 and 33, Fleming *et al.* describe a repeatable method to make secondary coatings (see col. 4, line 4, "multiple profile-preserving coatings") having blocking functions (see col. 4, line 7, "release properties").

With respect to claims 7 and 8, Anderson *et al.* describe fluorinated blocking agents (see col. 26, lines 36-41, "fluorinating (Teflonizing) or silanizing agents") which appears to eliminate contact with target molecule-containing liquids (see col. 26, lines 36-41, "repellant to the fluid to be eventually located inside each cell").

With respect to claims 10, 11, 13 and 16, Anderson *et al.* describe Protein A, Protein G, lectins, antibodies, streptavidin, polypeptide protein receptors, oligonucleotides (see col. 8, lines 57-61), avidin (see col. 21, line 17), metal affinity ligands (see col. 28, line 8, "transferrin") and protein binding dyes (see col. 16, lines 10-15).

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***Response to Arguments***

In prior Office Action, claims 1, 2, 4, 7, 8, 10, 11, 13, 15, 32 and 33 were rejected under 35 U.S.C. 102(b) as being anticipated by Arentzen *et al.* (US 5,491,083). Claim 3 was rejected under 35 U.S.C. 103(a) as being unpatentable over Arentzen *et al.* (US 5,491,083) in view of Hagen *et al.* (US 5,071,610).

Applicants' amendment incorporating limitations of claim 5 is sufficient to overcome these rejections. Accordingly, these rejections are withdrawn.

***Conclusion***

Claim 6 is allowable.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David J. Venci whose telephone number is (571)272-2879. The examiner can normally be reached on 08:00 - 16:30 (EST). If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on 571-272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

David J Venci  
Assistant Examiner  
Art Unit 1641

/dv/

/Mark L. Shibuya/  
Supervisory Patent Examiner, Art Unit 1641